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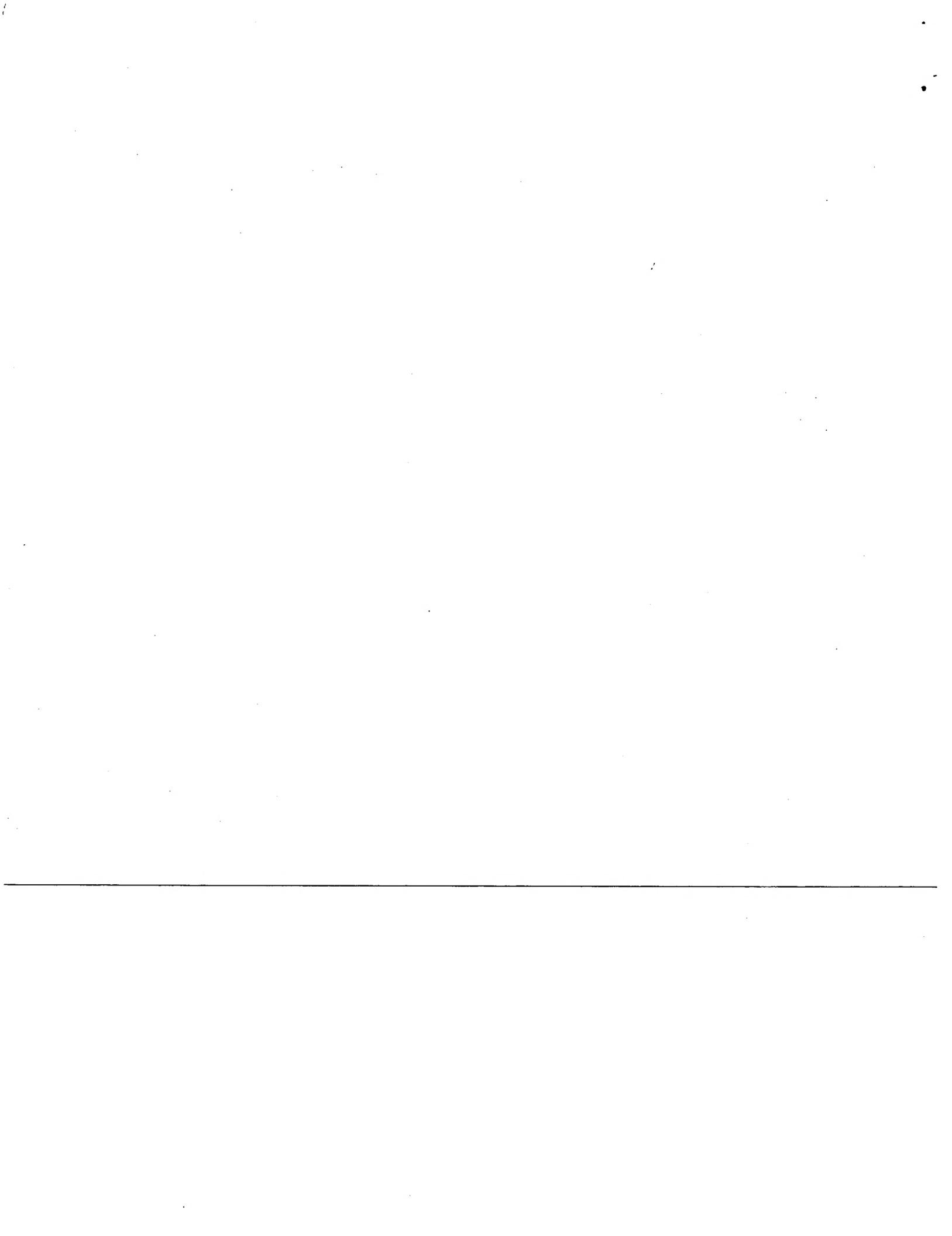
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30JUN99 E458129-1 C49445  
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The Patent Office

Cardiff Road  
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1. Your reference

CM2160F/SA

2. Patent app  
*(The Patent***9915094.8****28 JUN 1999**3. Full name, address and postcode of the or of each applicant *(underline all surnames)*

**The Procter & Gamble Company  
One Procter & Gamble Plaza  
Cincinnati, Ohio 45202, U.S.A.**

Patents ADP number *(if you know it)*

If the applicant is a corporate body, give the country/state of its incorporation

**United States of America**

772673081

4. Title of the invention

**COSMETIC COMPOSITIONS**5. Name of your agent *(if you have one)*

"Address for service" in the United Kingdom to which all correspondence should be sent  
*(including the postcode)*

**Sean Alexander  
Patent Department  
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7430776081

Patents ADP number *(if you know it)*6. If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and *(if you know it)* the or each application number

Country

Priority application number  
*(if you know it)*Date of filing  
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7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application

Number of earlier application

Date of filing  
*(day / month / year)*

8. Is a statement of inventorship and of right to grant of a patent required in support of this request? *(Answer 'Yes' if:*

- any applicant named in part 3 is not an inventor, or*
- there is an inventor who is not named as an applicant, or*
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Description

24  
8

Claim(s)

2

Abstract

1

Drawing(s)

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Priority documents

Translations of priority documents

Statement of inventorship and right to grant of a patent (*Patents Form 7/77*)

Request for preliminary examination and search (*Patents Form 9/77*)

Request for substantive examination  
(*Patents Form 10/77*)

Any other documents  
(please specify)

11.

I/We request the grant of a patent on the basis of this application.

Signature

*V. W. of*

Date 28 June 1999

VICTORIA WOOF

12. Name and daytime telephone number of person to contact in the United Kingdom

Sean Alexander 01784 474319

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Cosmetic Compositions

5

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10

Technical Field

The present invention relates to cosmetic compositions. In particular it relates to skin care compositions.

15

Background of the Invention

Skin is made up of several layers of cells which coat and protect the keratin and collagen fibrous proteins that form the skeleton of its structure. The outermost of these layers, referred to as the stratum corneum, is known to be composed of 25nm protein bundles surrounded by 8nm thick layers. Anionic surfactants and organic solvents typically penetrate the stratum corneum membrane and, by delipidization (i.e. removal of the lipids from the stratum corneum), destroy its integrity. This destruction of the skin surface topography leads to a rough feel and may eventually permit the surfactant or solvent to interact with the keratin, creating irritation.

It is now recognised that maintaining the proper water gradient across the stratum corneum is important to its functionality. Most of this water, which is sometimes considered to be the stratum corneum's plasticizer, comes from inside the body. If the humidity is too low, such as in a cold climate, insufficient water remains in the outer layers of the stratum corneum to properly plasticize the tissue, and the skin begins to scale and becomes itchy. Skin permeability is also decreased somewhat when there is inadequate water across the stratum corneum. On the other hand, too much water on the outside of the skin causes the stratum corneum to ultimately sorb three to five times its own weight of bound water. This swells and puckers the skin and results in approximately a two to three fold increase in the permeability of the skin to water and other polar molecules.

40 Thus, a need exists for compositions which will assist the stratum corneum in maintaining its barrier and water-retention functions at optimum performance in spite of deleterious interactions which the skin may encounter in washing, work, and recreation.

45 Desirable properties of skin care compositions are to provide good skin feel, water retention, moisturisation, absorption, and rub-in characteristics. One way of delivering high moisturisation to the skin is to incorporate polyhydric alcohol-

lik humectant materials such as glycerine into a composition. Skin compositions with high levels of polyhydric alcohols and therefore high levels of moisturisation, however, are often perceived by the consumer as unpleasant as such compositions can form very sticky residues when applied to the skin.

- 5 Another way of delivering desirable benefits to the skin is to incorporate oil-soluble skin care ingredients such as polyol carboxylic acid esters into skin care compositions. Again, such compositions can form undesirable, sticky residues when applied to the skin.
- 10 Thus, there remains a need for compositions which show low levels of stickiness or tackiness whilst providing high levels of moisturisation, as well as providing excellent skin feel, skin softness and skin smoothness benefits.

15 Quaternary ammonium cationic conditioning agents are known for use in fabric softener compositions and hair conditioning compositions.

It has now been unexpectedly found that compositions comprising certain quaternary ammonium cationic conditioning agents and relatively high levels of humectant provide good moisturisation benefits with low levels of stickiness or tack. The compositions also show good skin feel, skin softness and skin smoothness benefits.

#### Summary of the Invention

25 According to the present invention there is provided a cosmetic composition comprising:

(a) a quaternary ammonium cationic conditioning agent having formula (I):



wherein each R in a compound is a C<sub>6</sub>-C<sub>22</sub>, preferably with only minimal, or no, C<sub>6</sub>-C<sub>10</sub>, hydrocarbyl group, preferably having an Iodine Value (hereinafter also referred to as IV) of from about 70 to about 140 based upon the IV of the equivalent fatty acid; n is a number from 1 to three on the weight average in any mixture of compounds, each R<sup>1</sup> in a compound is a C<sub>1</sub>-C<sub>3</sub> alkyl or hydroxy alkyl group, the total of n and the number of R<sup>1</sup> groups that are hydroxyethyl groups equaling 3, n+m equaling 4, and X is a conditioner compatible anion, preferably methyl sulfate, the conditioning agent preferably having (a) a Hunter L transmission of at least about 85,

40 (b) non-detectable levels at the conditions of use of odorous compounds selected from isopropyl acetate, 2,2'-ethylidenebis(oxy)bispropane, and/or short fatty acid esters or (c) preferably both, wherein preferably the level of conditioning agent containing polyunsaturated alkylene groups being at least about 3% by weight of the total conditioning agent present and wherein the conditioning agent comprises a mixture of monoester and diester; and

(b) greater than 10%, by weight, of humectant.

5 The compositions of the invention provide good moisturisation benefits with low levels of stickiness or tack. According to a further aspect of the present invention there is provided a cosmetic method of treatment of the skin comprising applying to the skin a composition according to the present invention.

10 All percentages herein are by weight of the composition unless otherwise indicated. All ratios are weight ratios unless otherwise indicated. Unless otherwise indicated, all percentages, ratios, and levels of ingredients referred to herein are based on the actual amount of the ingredient, and do not include solvents, fillers, or other materials which may be combined with the ingredient

15 in commercially available products.

All documents referred to herein, including all patents, all patent applications and all articles, are hereby incorporated herein by reference in their entirety unless otherwise indicated.

20

#### Detailed Description of the Invention

The compositions of the present invention comprise two essential elements, a quaternary ammonium cationic conditioning agent and greater than 10%, by weight, of humectant. These elements will be described in more detail below.

25 The present compositions can be used for any suitable purpose. In particular, the present compositions are suitable for topical application to the skin. In particular, the skin care compositions can be in the form of creams, lotions, gels, and the like. Preferably the cosmetic compositions herein are in the form of an oil-in-water emulsion of one or more oil phases in an aqueous continuous phase, each oil phase comprising a single oily component or a mixture of oily components in miscible or homogeneous form but said different oil phases containing different materials or combinations of materials from each other.

35

The compositions of the present invention are preferably formulated so as to have a product viscosity of at least about 1,000 mPa.s and preferably in the range from about 1,000 to about 300,000 mPa.s, more preferably from about 1,500 to about 100,000 mPa.s and especially from about 2,000 to about 40,000 mPa.s (25°C, neat, Brookfield RVT Spindle No. 5).

40 **Quaternary Ammonium Cationic Conditioning Agent**  
 The quaternary ammonium cationic conditioning agent for use herein may be defined a Diester Quaternary Ammonium active (DEQA) selected from compounds having the formula (I):



(I)

wherein each R in a compound is a C<sub>6</sub>-C<sub>22</sub> hydrocarbyl group, preferably having an IV from about 70 to about 140 based upon the IV of the equivalent fatty acid with the cis/trans ratio preferably being as described hereinafter, n is a number

5 from 1 to three on the weight average in any mixture of compounds, each R<sup>1</sup> in a compound is a C<sub>1-3</sub> alkyl or hydroxy alkyl group, the total of n and the number of R<sup>1</sup> groups that are hydroxyethyl groups equaling 3, n+m equaling 4, and X is a conditioner compatible anion, preferably methyl sulfate. Preferably the  
 10 cis:trans isomer ratio of the fatty acid (of the C18:1 component) is at least about 1:1, preferably about 2:1, more preferably 3:1, and even more preferably about 4:1, or higher.

The compound, or mixtures of compounds, have (a) either a Hunter "L" transmission of at least about 85, typically from about 85 to about 95, preferably from about 90 to about 95, more preferably above about 95, if possible, (b) only low, relatively non-detectable levels, at the conditions of use, of odorous compounds selected from: isopropyl acetate; 2,2'-ethylidenebis (oxy)bispropane; 1,3,5-trioxane; and/or short chain fatty acid (4-12, especially 6-10, carbon atoms) esters, especially methyl esters; or (c) preferably, both.

20 The Hunter L transmission is measured by (1) mixing the conditioning active with solvent at a level of about 10% of active, to assure clarity, the preferred solvent being ethoxylated (one mole EO) 2,2,4-trimethyl-1,3-pentanediol and (2) measuring the L color value against distilled water with a Hunter ColorQUEST(RTM) colorimeter made by Hunter Associates Laboratory, Reston, Virginia.

30 The level of odourant is defined by measuring the level of odourant in a headspace over a sample of the conditioning active (about 92% active). Chromatograms are generated using 200 mL of head space sample over about 2 grams of sample. The head space sample is trapped on to a solid absorbent and thermally desorbed onto a column directly via cryofocussing at about -100° C. The identifications of materials is based on the peaks in the chromatograms. Some impurities identified are related to the solvent used in the quaternization process, (e.g., ethanol and isopropanol). The ethoxy and methoxy ethers are typically sweet in odour. There are C<sub>6</sub>-C<sub>8</sub> methyl esters found in the current commercial samples, but not in the typical conditioner actives of this invention. These esters contribute to the perceived poorer odour of the current commercial samples. The level of each odourant found in a typical commercial  
 35 sample is as follows:

**Approximate concentration of head space impurities**

<b>Chemical Identification</b>	<b>Gas phase concentration (ng/L)</b>	
	<b>Commercial sample</b>	<b>Typical invention sample</b>
Isopropyl acetate	6	< 1
1,3,5-trioxane	61	5

2,2'- thylidenebis(oxy)- bispropane	244	< 1
C6 methyl ester	10	< 1
C8 Methyl ester	9	< 1
C10 Methyl ester	4	< 1

The acceptable level of each odourant is as follows: isopropyl acetate should be less than about 5, preferably less than about 3, and more preferably less than about 2, nanograms per litre ( $\text{ng/L}$ .); 2,2'-ethyldenebis(oxy)bispropane should be less than about 200, preferably less than about 100, more preferably less than about 10, and even more preferably less than about 5, nanograms per litre ( $\text{ng/L}$ .); 1,3,5-trioxane should be less than about 50, preferably less than about 20, more preferably less than about 10, and even more preferably less than about 7, nanograms per litre ( $\text{ng/L}$ .); and/or each short chain fatty acid (4-12, especially 6-10, carbon atoms) ester, especially methyl esters should be less than about 4, preferably less than about 3, and more preferably less than about 2, nanograms per liter ( $\text{ng/L}$ .).

The elimination of colour and odour materials can either be accomplished after formation of the compound, or, preferably, by selection of the reactants and the reaction conditions. Preferably, the reactants are selected to have good odour and colour. For example, it is possible to obtain fatty acids, or their esters, for sources of the long fatty acyl group, that have good colour and odour and which have extremely low levels of short chain ( $\text{C}_{4-12}$ , especially  $\text{C}_{6-10}$ ) fatty acyl groups. Also, the reactants can be cleaned up prior to use. For example, the fatty acid reactant can be double or triple distilled to remove colour and odour causing bodies and remove short chain fatty acids. Additionally, the colour of the triethanolamine reactant needs to be controlled to a low colour level (e.g. a colour reading of about 20 or less on the APHA scale). The degree of clean up required is dependent on the level of use and the presence of other ingredients. For example, adding a dye can cover up some colours. However, for clear and/or light coloured products, the colour must be almost non-detectable. This is especially true for higher levels of active, e.g., from about 8% to about 75%, preferably from about 13% to about 60%, more preferably from about 18% to about 40%, of the conditioner active by weight of the composition. Similarly, the odour can be covered up by higher levels of perfume, but at the higher levels of conditioner active there is a relatively high cost associated with such an approach, especially in terms of having to compromise the odour quality. Odour quality can be further improved by use of ethanol as the quaternization reaction solvent.

Preferred biodegradable conditioning compounds comprise quaternary ammonium salt, the quaternized ammonium salt being a quaternized product of condensation between:

a)-a fraction of saturated or unsaturated, linear or branched fatty acids, or of derivatives of said acids, said fatty acids or derivatives each possessing a hydrocarbon chain in which the number of atoms is between 5 and 21, and

b)-triethanolamine,

characterised in that said condensation product has an acid value, measured by titration of the condensation product with a standard KOH solution against a phenolphthalein indicator, of less than about 6.5.

5

The acid value is preferably less than or equal to about 5, more preferably less than about 3. Indeed, the lower the AV, the better softness performance is obtained.

10 The acid value is determined by titration of the condensation product with a standard KOH solution against a phenolphthalein indicator according to ISO#53402. The AV is expressed as mg KOH/g of the condensation product.

15 It is preferred that the reactants are present in a molar ratio of fatty acid fraction to triethanolamine of from about 1:1 to about 2.5:1.

20 Preferred cationic, preferably biodegradable quaternary, ammonium conditioning compounds can contain the group -(O)CR which is derived from animal fats, unsaturated, and polyunsaturated, fatty acids, e.g., oleic acid, and/or partially hydrogenated fatty acids, derived from vegetable oils and/or partially hydrogenated vegetable oils, such as, canola oil, safflower oil, peanut oil, sunflower oil, corn oil, soybean oil, tall oil, rice bran oil, etc. Non-limiting examples of fatty acids (FA) have the following approximate distributions:

	Fatty Group	Acyl	FA1	FA2	FA3	FA4	FA5
25	C12		trace	trace	0	0	0
	C14		3	3	0	0	0
	C16		4	4	5	5	5
	C18		0	0	5	6	6
	C14:1		3	3	0	0	0
30	C16:1		11	7	0	0	3
	C18:1		74	73	71	68	67
	C18:2		4	8	8	11	11
	C18:3		0	1	1	2	2
	C20:1		0	0	2	2	2
35	C20 and up		0	0	2	0	0
	Unknowns		0	0	6	6	7
	Total		99	99	100	100	102
40	IV		86-90	88-95	99	100	95
	cis/trans (C18:1)		20-30	20-30	4	5	5
	TPU		4	9	10	13	13

TPU is the percentage of polyunsaturates pr sent.

Mixtures of fatty acids, and mixtures of FAs that are derived from different fatty acids can be used, and are preferred. Nonlimiting examples of FA's that can be blended, to form FA's of this invention are as follows:

	<u>Fatty Acyl Group</u>	<u>FA6</u>	<u>FA7</u>
5	C14	0	1
	C16	11	25
	C18	4	20
	C14:1	0	0
	C16:1	1	0
10	C18:1	27	45
	C18:2	50	6
	C18:3	7	0
	Unknowns	0	3
	<i>Total</i>	100	100
15	IV	125-138	56
	cis/trans (C18:1)	Not Available	7
	TPU	57	6

20 FA<sup>6</sup> is prepared from a soy bean fatty acid, and FA<sup>7</sup> is prepared from a slightly hydrogenated tallow fatty acid.

25 The more preferred essential conditioning actives containing an effective amount of molecules containing two ester linked hydrophobic groups [RC(CO)O-], said actives being referred to hereinafter as "DEQA's", are those that are prepared as a single DEQA from blends of all the different fatty acids that are represented (total fatty acid blend), rather than from blends of mixtures of separate finished DEQA's that are prepared from different portions of the total fatty acid blend.

30 It is preferred that at least a majority of the fatty acyl groups are unsaturated, e.g., from about 50% to 100%, preferably from about 55% to about 95%, more preferably from about 60% to about 90%, and that the total level of active containing polyunsaturated fatty acyl groups (TPU) be preferably from about 3% to about 30%. The cis/trans ratio for the unsaturated fatty acyl groups is usually important, with the cis/trans ratio being from about 1:1 to about 50:1, the minimum being about 1:1, preferably at least 3:1, and more preferably from about 4:1 to about 20:1. (As used herein, the "percent of conditioner active" containing a given R group is the same as the percentage of that same R group

35 is to the total R groups used to form all of the conditioner actives.)

40 The unsaturated, including the preferred polyunsaturated, fatty acyl and/or alkylene groups, discussed hereinbefore and hereinafter, surprisingly provide effective conditioning, but also provide better rewetting characteristics, good antistatic characteristics, and especially, superior recovery after freezing and thawing.

The highly unsaturated materials are also easier to formulate into concentrated premixes that maintain their low viscosity and are therefore easier to process, e.g., pump, mixing, etc. These highly unsaturated materials (total level of active 5 containing polyunsaturated fatty acyl groups (TPU) being typically from about 3% to about 30%, with only the low amount of solvent that normally is associated with such materials, i.e., from about 5% to about 20%, preferably from about 8% to about 25%, more preferably from about 10% to about 20%, weight of the total conditioner/solvent mixture, are also easier to formulate into 10 concentrated, stable compositions of the present invention, even at ambient temperatures. This ability to process the actives at low temperatures is especially important for the polyunsaturated groups, since it minimizes degradation. Additional protection against degradation can be provided when 15 the compounds and conditioning compositions contain effective antioxidants, chelants, and/or reducing agents, as disclosed hereinafter.

It will be understood that substituents R and R<sup>1</sup> can optionally be substituted with various groups such as alkoxy or hydroxyl groups, and can be straight, or branched so long as the R groups maintain their basically hydrophobic 20 character.

A preferred long chain DEQA is the DEQA prepared from sources containing high levels of polyunsaturation, i.e., N,N-di(acyl-oxyethyl)-N,N-methylhydroxyethylammonium methyl sulfate, where the acyl is derived from 25 fatty acids containing sufficient polyunsaturation, e.g., mixtures of tallow fatty acids and soybean fatty acids. Another preferred long chain DEQA is the dioleyl (nominally) DEQA, i.e., DEQA in which N,N-di(oleoyl-oxyethyl)-N,N-methylhydroxyethylammonium methyl sulfate is the major ingredient. Preferred 30 sources of fatty acids for such DEQAs are vegetable oils, and/or partially hydrogenated vegetable oils, with high contents of unsaturated, e.g., oleoyl groups.

As used herein, when the DEQA diester (n=2) is specified, it can include the monoester (n=1) and/or triester (n=3) that are present. Preferably, at least 35 about 30% of the DEQA is in the diester form, and from 0% to about 30% can be DEQA monoester, e.g., there are three R<sup>1</sup> group. The overall ratios of diester quat to monoester quat are from about 2.5:1 to about 1:1, preferably from about 2.3:1 to about 1.3:1. The level of monoester present can be controlled in manufacturing the DEQA by varying the ratio of fatty acid, or fatty 40 acyl source, to triethanolamine. The overall ratios of diester quat to triester quat are from about 10:1 to about 1.5:1, preferably from about 5:1 to about 2.8:1.

The above compounds, used as the essential biodegradable quaternized ester-45 amine conditioning material in the practice of this invention, can be prepared using standard reaction chemistry. In one synthesis of a di-ester variation of DTDMAC, an amine of the formula N(CH<sub>2</sub>CH<sub>2</sub>OH)<sub>3</sub> is esterified, preferably at

two hydroxyl groups, with an acid chloride of the formula  $\text{RC(O)Cl}$ , to form an amine which can be made cationic by acidification (on R is H) to be one type of conditioner, or then quaternized with an alkyl halide,  $\text{R}'\text{X}$ , to yield the desired reaction product (wherein R and R' are as defined hereinbefore). However, it will be appreciated by those skilled in the chemical arts that this reaction sequence allows a broad selection of agents to be prepared.

5 In preferred DEQA conditioner actives, each R is a hydrocarbyl, or substituted hydrocarbyl, group, preferably, alkyl, monounsaturated alkenyl, and polyunsaturated alkenyl groups, with the conditioner active containing polyunsaturated alkenyl groups being preferably at least about 3%, more preferably at least about 5%, more preferably at least about 10%, and even more preferably at least about 15%, by weight of the total conditioner active present; the actives preferably containing mixtures of R groups, especially 10 within the individual molecules.

15 In preferred quaternary ammonium compounds, and especially in the DEQAs,  $\text{RC(O)O}$  is derived from unsaturated fatty acid, e.g., oleic acid, and/or fatty acids and/or partially hydrogenated fatty acids, derived from animal fats, 20 vegetable oils and/or partially hydrogenated vegetable oils, such as: canola oil; safflower oil; peanut oil; sunflower oil; soybean oil; corn oil; tall oil; rice bran oil; etc.] [As used herein, similar biodegradable actives containing ester linkages are referred to as "DEQA", which includes both diester, triester, and monoester compounds containing from one to three, preferably two, long chain 25 hydrophobic groups. These actives have the characteristic that they can be processed by conventional mixing means at ambient temperature, at least in the presence of about 15% of solvent C. as disclosed hereinbefore.

30 The DEQAs herein can also contain a low level of fatty acid, which can be from unreacted starting material used to form the DEQA and/or as a by-product of any partial degradation (hydrolysis) of the conditioner active in the finished composition. It is preferred that the level of free fatty acid be low, preferably below about 15%, more preferably below about 10%, and even more preferably below about 5%, by weight of the conditioner active.

35 The above compounds, used as the quaternized ester-amine conditioning active in the practice of this invention, can be prepared using standard reaction chemistry. In one synthesis of a di-ester variation of DTDMAC, an amine of the formula  $\text{RN}(\text{CH}_2\text{CH}_2\text{OH})_2$ , is esterified at both hydroxyl groups with an acid chloride of the formula  $\text{R}'\text{C(O)Cl}$ , then quaternized with an alkyl halide, RX, to 40 yield the desired reaction product (wherein R and R' are as defined hereinbefore). However, it will be appreciated by those skilled in the chemical arts that this reaction sequence allows a broad selection of agents to be prepared.

45 The actives of the present invention are preferably prepared by a process wherein a chelant, preferably a diethylenetriaminepentaacetate (DTPA) and/or

an ethylene diamine-N,N'-disuccinate (EDDS) is added to the process. Also, preferably, antioxidants are added to the fatty acid immediately after distillation and/or fractionation and/or during the esterification reactions and/or prior to, or during, the quaternization reaction, and/or post-added to the finished 5 conditioner active. The resulting conditioner active has reduced discoloration and malodor associated therewith. The typical process comprises the steps of:  
a) providing a source of triglyceride and reacting the source of triglyceride to form a mixture of fatty acids and/or fatty acid esters;  
b) using the mixture formed from step (a) to react under esterification 10 conditions with triethanolamine;  
c) quaternizing, if desired, the mixture of fatty acid esters formed from step (b) by reacting the mixture under quaternizing conditions with a quaternizing agent of the formula  $R^1X$  wherein  $R^1$  is defined as in step (b) and X is a conditioner compatible anion, preferably selected from the group consisting 15 of chloride, bromide, methylsulfate, ethylsulfate, sulfate, and nitrate thereby forming a quaternary conditioning active, the methyl sulfate and ethyl sulfate being highly preferred, wherein at least step (c) is carried out in the presence of a chelating agent selected from the group consisting of diethylenetriaminepentaacetic acid, ethylenediamine-N,N'-disuccinic acid and 20 mixtures thereof.

The step of reacting the source of triglyceride can further include reacting in the presence of the chelating agent step (b) can further include the presence of the chelating agent.

25 The total amount of added chelating agent is preferably within the range of from about 10 ppm to about 5,000 ppm, more preferably within the range of from about 100 ppm to about 2500 ppm by weight of the formed active. The source of triglyceride is preferably selected from the group consisting of animal fats, 30 vegetable oils, partially hydrogenated vegetable oils, and mixtures thereof. More preferably, the vegetable oil or partially hydrogenated vegetable oil is selected from the group consisting of canola oil, partially hydrogenated canola oil, safflower oil, partially hydrogenated safflower oil, peanut oil, partially hydrogenated peanut oil, sunflower oil, partially hydrogenated sunflower oil, 35 corn oil, partially hydrogenated corn oil, soybean oil, partially hydrogenated soybean oil, tall oil, partially hydrogenated tall oil, rice bran oil, partially hydrogenated rice bran oil, and mixtures thereof. Most preferably, the source of triglyceride is canola oil, partially hydrogenated canola oil, and mixtures thereof. The process can also include the step of adding from about 0.01% to 40 about 2% by weight of the composition of an antioxidant compound to any or all of steps (a), (b) or (c).

45 The above processes produce a conditioner active with reduced coloration and malodor.

The DEQA actives described hereinabove can contain a low level of the fatty acids which can be unreacted starting material and/or by-product of any partial

degradation, e.g., hydrolysis, of the actives in the finished compositions. It is preferred that the level of free fatty acid be low, preferably below about 10%, more preferably below about 5%, by weight of the active.

5 Particularly preferred conditioning actives and their methods of preparation are disclosed in US Application No. 60/044719.

Commercially available diester quaternary ammonium compound for use herein include Tetranyl Co-40 supplied by Kao. The INCI name for this material is  
10 Dioleylethyl Hydroxyethylmonium methosulfate.

A particularly preferred conditioning active for use herein is SC3 which is manufactured according to the synthesis example below.

15 Detailed Synthesis of new conditioning active "SC3"

Step 1, fatty alcohol compound synthesis:

A mixture of about 1,200 grams of the hydrogenated oil from Synthesis Example F (see below) and about 200 grams of the hydrogenated oil from Synthesis Example A (see below) is hydrolyzed three times with about 250°C  
20 steam at about 600 psig for about 2.5 hours at a ratio of steam:oil of about 1.2 (by weight). An aqueous solution containing the glycerine which had split off is removed.

The resulting mixture of fatty acids is vacuum distilled for a total of about 150 minutes, in which the pot temperature rose gradually from about 200°C to about  
25 238°C and the head temperature rose gradually from about 175°C to about 197°C. Vacuum of about 0.3-0.6 mm is maintained.

30 The fatty acids product of the vacuum distillation has an Iodine Value of about 99.1, an amine value (AV) of about 197.6 and a saponification value (SAP) of about 198.6.

step 2)-Esterification:

35 About 571 grams of Canola fatty acid with an IV of about 100 and an Acid Value of about 196 as made according to the above Fatty Acid Compound Synthesis is added into the reactor, the reactor is flushed with N<sub>2</sub> and about 149 grams of triethanolamine is added under agitation. The molar ratio of fatty acid to triethanol amine is of about 1.875:1. The mixture is heated above about 150°C and the pressure is reduced to remove the water of condensation. The  
40 reaction is prolonged until an Acid Value of about 3 is reached.

Step 3)-Quaternization:

To the about 698 grammes of the product of condensation, about 122 grams of dimethylsulfate is added under continuous agitation. The reaction mixture is kept above about 50°C and the reaction is followed by verifying the residual amine value.  
45

About 820 grams of conditioner compound of the invention is obtained.

The quaternized material is optionally diluted with e.g. about 15% of an approximately 50:50 ethanol/ hexyleneglycol, preferably more hexylene glycol than ethanol, mixture which lowers the melting point of the material thereby

5 providing a better ease in the handling of the material.

**Other Fatty Acid and hair Conditioner Synthesis Examples**

**Fatty Acid Compound Synthesis Example A**

About 1,300 grams of food grade (refined, bleached, degummed) canola oil and approximately 6.5 grams of a commercial nickel hydrogenation catalyst (Engelhard, "N-545"®) corresponding to approximately 0.13 wt.% Ni, are placed in a hydrogenation reactor which is equipped with stirrer. The reactor is sealed and evacuated. The contents are heated to about 170°C and hydrogen is fed into the reactor. Stirring at about 450 rpm is maintained throughout the reaction. After about 10 minutes the temperature in the reactor is about 191°C and the hydrogen pressure is about 11 psig. The temperature is held at about 190°C.

15 After about 127 minutes from when the hydrogen feed began, the hydrogen pressure is about 10 psig. A sample of the reaction mass is drawn and found to have an Iodine Value of about 78 and a cis:trans ratio of about 1.098. After another about 20 minutes at about 190°C, the hydrogen pressure is about 9.8 psig. The hydrogen feed is discontinued and the reactor contents cooled with stirring. The final reaction product has an Iodine Value of about 20 74.5 and a cis:trans ratio of about 1.35.

25 The product that forms in the reactor is removed and filtered. It has a cloud point of about 22.2°C. The chain length distributions of the acyl substituents on the sample taken at about 127 minutes, and of the final product, are determined to be as shown in Table 1 in which "sat." means saturated, and "mono" and "di" means monounsaturated and diunsaturated, respectively.

30

**TABLE 1**  
**Approximate Percent (mol.)**

Chain length	Sample @ 127 min.	Product
C14-sat.	0.1	0.1
35 C16-sat.	4.7	4.6
C16-mono.	0.4	0.4
C18-sat.	8.9	13.25
C18-mono.	77.0	73.8
C18-di.	4.5	3.1
40 C20-sat.	0.7	0.75
C-20-mono.	2.1	2.0
Other	1.6	2.0

**Fatty Acid Compound Synthesis Example B**

45 About 1,300 grams of food grade canola oil and about 5.2 grams of Engelhard "N-545"® nickel hydrogenation catalyst are placed in a hydrogenation reactor which is equipped with a stirrer. The reactor is sealed and vacuated. The

contents are heated to about 175°C and hydrogen is fed into the reactor. Stirring is maintained at about 450 rpm throughout the course of reaction. After about 5 minutes the temperature in the reactor is about 190°C and the hydrogen pressure is about 7 psig. The temperature is held at about 190°C.

5 After about 125 minutes from the start of the hydrogen feed, the hydrogen pressure is about 7 psig. A sample of the reaction mass is drawn and found to have an Iodine Value of about 85.4. After another about 20 minutes at about 190°C, the hydrogen pressure is about 6 psig. The hydrogen feed is discontinued and the reactor contents cooled with stirring. The final reaction product has an Iodine Value of about 80. The product that forms in the reactor is removed and filtered. It has a cloud point of about 18.6°C.

10

#### Fatty Acid Compound Synthesis Example C

About 1,300 grams of food grade canola oil and about 2.9 grams of Engelhard "N-545"® nickel hydrogenation catalyst are placed in a hydrogenation reactor which is equipped with a stirrer. The reactor is sealed and evacuated. The contents are heated to about 180°C and hydrogen is fed into the reactor. Stirring is maintained at about 450 rpm throughout the course of the reaction. After about 5 minutes the temperature in the reactor is about 192°C and the hydrogen pressure is about 10 psig. The temperature is held at about 190 ±3°C. After about 105 minutes from the start of the hydrogen feed, the hydrogen pressure is about 10 psig. A sample of the reaction mass is drawn and found to have an Iodine Value of about 85.5. After another about 20 minutes at about 190°C, the hydrogen pressure is about 10 psig. The hydrogen feed is discontinued and the reactor contents cooled with stirring. The final reaction product has an Iodine Value of about 82.4. The product that forms in the reactor is removed and filtered. It has a cloud point of about 17.2°C.

30 Fatty Acid Compound Synthesis Example D

About 1,300 grams of food grade canola oil and about 1.4 grams of Engelhard "N-545"® nickel hydrogenation catalyst are placed in a hydrogenation reactor which is equipped with a stirrer. The reactor is sealed and evacuated. The contents are heated to about 180°C and hydrogen is fed into the reactor. After about 5 minutes the temperature in the reactor is about 191°C and the hydrogen pressure is about 10 psig. The temperature is held at about 190 ±3°C. After about 100 minutes from the start of the hydrogen feed, the hydrogen pressure is about 10 psig. A sample of the reaction mass is drawn and found to have an Iodine Value of about 95.4. After another about 20 minutes at about 190°C, the hydrogen pressure is about 10 psig. The hydrogen feed is discontinued and the reactor contents cooled with stirring. The final reaction product had an Iodine Value of about 2.3. The product that forms in the reactor is removed and filtered. It has a cloud point of about 34°C.

45 Fatty Acid Compound Synthesis Example E

About 1,300 grams of food grade canola oil and about 1.3 grams of Engelhard "N-545"® nickel hydrogenation catalyst are placed in a hydrogenation reactor

which is equipped with a stirrer. The reactor is sealed and evacuated. The contents are heated to about 190°C and hydrogen is fed into the reactor to a hydrogen pressure of about 5 psig. After about 3 hours from the start of the hydrogen feed, a sample of the reaction mass is drawn and found to have an iodine value of about 98. The hydrogenation is interrupted, another about 0.7 grams of the same catalyst is added, and the reaction conditions are reestablished at about 190°C for another about 1 hour. The hydrogen feed is then discontinued and the reactor contents cooled with stirring. The final reaction product had an Iodine Value of about 89.9. The product that forms in the reactor is removed and filtered. It has a cloud point of about 16°C.

#### Fatty Acid Compound Synthesis Example F

About 1,300 grams of food grade canola oil and about 2.0 grams of Engelhard "N-545"® nickel hydrogenation catalyst are placed in a hydrogenation reactor which is equipped with a stirrer. The reactor is sealed and evacuated. The contents are heated to about 190°C and hydrogen is fed into the reactor to a hydrogen pressure of about 5 psig. Stirring is maintained at about 420 rpm throughout the course of reaction of the hydrogen feed. After about 130 minutes from the start of the hydrogen feed, the hydrogen feed is discontinued and the reactor contents cooled with stirring. The final reaction product had an Iodine Value of about 96.4. The product that forms in the reactor is removed and filtered. It has a cloud point of about 11.2°C.

25      Synthesis Example of conditioning compound 1 (SC1)

1)-Esterification:

About 489 grams of partly hydrogenated tallow fatty acid with an IV of about 45 and an Acid Value of about 206, commercially available under the tradename Distal 51 and sold by Witco Corporation, is added into the reactor, the reactor is flushed with N<sub>2</sub> and about 149 grams of triethanolamine is added under agitation. The molar ratio of fatty acid to triethanol amine is of about 1.8:1. The mixture is heated above about 150° C and the pressure is reduced to remove the water of condensation. The reaction is prolonged until an Acid Value of about 5 is reached.

35

2)-Quaternization:

To about 627 grams of the product of condensation, about 122 grams of dimethylsulfate is added under continuous agitation. The reaction mixture is kept above about 50°C and the reaction is followed by verifying the residual amine value. 749 grams of conditioner compound of the invention is obtained.

The quaternized material is optionally diluted with e.g. about 15% of ethanol which lowers the melting point of the material thereby providing a better handling of the material.

45

Synthesis Example of conditioning compound 2 (SC2)

1)-Esterification:

About 504 grams of oleic fatty acid with an IV of about 90 and an Acid Value of about 198, commercially available under the tradenam Emersol 233 and sold by Henkel Corporation, is added into the reactor, the reactor is flushed with N<sub>2</sub> and about 149 grams of triethanolamine is added under agitation. The molar ratio of fatty acid to triethanol amine is about 1.8:1. The mixture is heated above about 150°C and the pressure is reduced to remove the water of condensation. The reaction is prolonged until an Acid Value of about 2 is reached.

**5 10 2)-Quaternization:**

To the about 629 grams of the product of condensation, about 122 grams of dimethylsulfate is added under continuous agitation. The reaction mixture is kept above about 50°C and the reaction is followed by verifying the residual amine value.

**15** About 751 grams of conditioner compound of the invention is obtained.

The quaternized material is optionally diluted with e.g. about 8% of ethanol which lower the melting point of the material thereby providing a better ease in the handling of the material.

**20 20 Synthesis Example of Hair Conditioner compound 4 (SC4)**

**1)-Esterification:**

About 457 grams of Canola fatty acid with an IV of about 100 and an Acid Value of about 196, as made according to Fatty Acid Compound Synthesis

**25** Example G, is added into the reactor, the reactor is flushed with N<sub>2</sub> and about 149 grams of triethanolamine is added under agitation. The molar ratio of fatty acid to triethanol amine is about 1.6:1. The mixture is heated above about 150° C and the pressure is reduced to remove the water of condensation. The reaction is prolonged until an Acid Value of about 1 is reached.

**30 30 2)-Quaternization:**

To the about 582 grams of the product of condensation, about 122 grams of dimethylsulfate is added under continuous agitation. The reaction mixture is kept above about 50°C and the reaction is followed by verifying the residual

**35** amine value.  
704 grams of conditioner compound of the invention is obtained.

The quaternized material is optionally diluted with e.g. about 8% of ethanol which lower the melting point of the material thereby providing a better ease in the handling of the material.

**40** The above synthesized compounds have a Hunter L transmission of about 90 and the following levels of odorants in  $\mu\text{g}/\text{L}$ : Isopropyl acetate < about 1, typically non-detectable; 1,3,5-trioxane about 5.3; 2,2'-ethylidenebis(oxy)-  
**45** bispropane < about 1, typically non-detectable; C6 methyl ester < about 1, typically non-detectable; C8 Methyl ester < about 1, typically non-detectable; and C10 Methyl ester < about 1, typically non-detectable.

The above synthesized conditioner compounds are also exemplified below in the non-limiting composition examples.

**5 Abbreviations used in the Examples**

In the compositions, the abbreviated component identification have the following meanings:

SC1	: Compound as made according to Synthesis Example of conditioner compound 1
SC2	: Compound as made according to Synthesis Example of conditioner compound 2
SC3	: Compound as made according to Synthesis Example of conditioner compound 3
SC4	: Compound as made according to Synthesis Example of conditioner compound 4

10 The quaternary ammonium conditioning agent, is preferably present at a level of from about 0.1% to about 20%, preferably from about 1% to about 10%, more preferably from about 2% to about 4.5%, by weight of total composition.

***Humectant***

15 A second essential component of the compositions of the present invention is that they comprise greater than 10%, by weight, of humectant. As used herein the term "humectant" means a substance which provides the skin with water-retention benefits. Any humectant suitable for use on skin may be used herein. Non-limiting examples of suitable humectants for use in the present invention are described in WO98/22085, WO98/18444 and WO97/01326. Further suitable humectants include amino acids and derivatives thereof such as proline and arginine aspartate, 1,3-butylene glycol, propylene glycol and water and codium tomentosum extract, collagen amino acids or peptides, creatinine, diglycerol, biosaccharide gum-1, glucamine salts, glucuronic acid salts, glutamic acid salts, polyethylene glycol ethers of glycerine (e.g. glycereth 20), glycerine, glycerol monopropoxylate, glycogen, hexylene glycol, honey, and extracts or derivatives thereof, ~~hydrogenated starch hydrolysates, hydrolyzed mucopolysaccharides, inositol, keratin amino acids, urea, LAREX A-200 (available from Larex), glycosaminoglycans, methoxy PEG 10, methyl gluceth-10 and -20 (both commercially available from Amerchol located in Edison, NJ), methyl glucose, 3-methyl-1,3-butanediol, N-acetyl glucosamine salts, panthenol, polyethylene glycol and derivatives thereof (such as PEG 15 butanediol, PEG 4, PEG 5 pentaerythritol, PEG 6, PEG 8, PEG 9), pentaerythritol, 1,2 pentanediol, PPG-1 glycetyl ether, PPG-9, 2-pyrrolidone-5-carboxylic acid and its salts such as glyceryl pca, saccharide isomerate, SEACARE (available from Secma), sericin, silk amino acids, sodium acetylhyaluronate, sodium hyaluronate, sodium poly-aspartate, sodium polyglutamate, sorbeth 20, sorbeth 6, sugar and sugar alcohols and derivatives thereof such as glucose, mannose and polyglycerol sorbitol, trehalose,~~

triglycerol, trimethylolpropane, tris (hydroxymethyl) amino methane salts, and yeast extract, and mixtures thereof.

5 Preferably, the humectants for use herein are selected from glycerine, urea, butylene glycol, hexylene glycol, panthenol and polyethylene glycol and derivatives thereof, or mixtures thereof. More preferably, the humectants for use herein are selected from glycerine, urea and mixtures thereof, especially glycerine.

10 Preferably the compositions of the present invention will comprise from about 12% to about 60%, more preferably from about 15% to about 50%, even more preferably from about 20% to about 40%, by weight, of humectant.

#### ***Optional Ingredients***

15 The compositions herein can contain a variety of optional components suitable for rendering the present compositions more cosmetically or aesthetically acceptable or to provide them with additional usage benefits. Such conventional optional ingredients are well-known to those skilled in the art. These include any cosmetically acceptable ingredients such as those found in

20 the *CTFA International Cosmetic Ingredient Dictionary and Handbook*, 7th edition, edited by Wenninger and McEwen, (The Cosmetic, Toiletry, and Fragrance Association, Inc., Washington, D.C., 1997). Some non-limiting examples of these optional ingredients are given below.

#### ***Oil-Soluble Skin Care Component***

25 The compositions of the present invention preferably comprise an oil-soluble skin care component. The oil-soluble skin care component of the present invention can comprise any suitable oil-soluble material or mixtures of materials. Suitable materials include those which, for example, give

30 moisturisation, protection, skin feel, skin softness and/or skin smoothness benefits. Preferably, the oil-soluble skin care component of the compositions herein comprises an emollient material.

35 Preferably, the compositions of the present invention comprise about 0.1% to about 40%, preferably from about 5% to about 30%, by weight, of an oil-soluble, skin care ingredient.

#### ***Emollient Materials***

40 The compositions of the present invention can comprise emollient materials. Preferably, the compositions of the present invention comprise from about 0.1% to about 40%, more preferably from about 1% to about 30%, and especially from about 5% to about 25% by weight of emollient. Emollients tend to lubricate the skin, increase the smoothness and suppleness of the skin, prevent or relieve dryness of the skin, and/or protect the skin. A wide variety of suitable emollients are known and may be used herein. *Sagarin, Cosmetics, Science and Technology*, 2nd Edition, Vol. 1, pp. 32-43 (1972) contains numerous

examples of materials suitable as an emollient. Illustrative examples of emollients include:

- i) Straight and branched chain hydrocarbons having from about 7 to about 40 carbon atoms, such as dodecane, squalane, cholesterol, hydrogenated polyisobutylene, isohexadecane and the C<sub>7</sub>-C<sub>40</sub> isoparaffins, which are C<sub>7</sub>-C<sub>40</sub> branched hydrocarbons.
- 5 ii) C<sub>1</sub>-C<sub>30</sub> alcohol esters of C<sub>1</sub>-C<sub>30</sub> carboxylic acids and of C<sub>2</sub>-C<sub>30</sub> dicarboxylic acids, e.g. isononyl isononanoate, isopropyl myristate, myristyl propionate, isopropyl stearate, behenyl behenate, dioctyl maleate, diisopropyl adipate, and diisopropyl dilinoleate.
- 10 iii) mono-, di- and tri- glycerides of C<sub>1</sub>-C<sub>30</sub> carboxylic acids and ethoxylated derivatives thereof, e.g., caprylic/capric triglyceride, PEG-6 caprylic/capric triglyceride.
- 15 iv) alkylene glycol esters of C<sub>1</sub>-C<sub>30</sub> carboxylic acids, e.g. ethylene glycol mono- and di- esters, and propylene glycol mono- and di- esters of C<sub>1</sub>-C<sub>30</sub> carboxylic acids e.g., ethylene glycol distearate.
- 20 v) Organopolysiloxane oils. The organopolysiloxane oil may be volatile, non-volatile, or a mixture of volatile and non-volatile silicones. The term "non-volatile" as used in this context refers to those silicones that are liquid under ambient conditions and have a flash point (under one atmospheric of pressure) of or greater than about 100°C. The term "volatile" as used in this context refers to all other silicone oils. Suitable organopolysiloxanes can be selected from a wide variety of silicones spanning a broad range of volatilities and viscosities. Non-volatile polysiloxanes are preferred.
- 25 Suitable silicones are disclosed in U.S. Patent No. 5,069,897, issued December 3, 1991. Preferred for use herein are organopolysiloxanes selected from polyalkylsiloxanes, alkyl substituted dimethicones, dimethiconols, polyalkylaryl siloxanes, and mixtures thereof. More preferred for use herein are polyalkylsiloxanes and cyclomethicones.
- 30 Preferred among the polyalkylsiloxanes are dimethicones.
- vi) Vegetable oils and hydrogenated vegetable oils. Examples of vegetable oils and hydrogenated vegetable oils include safflower oil, castor oil, coconut oil, cottonseed oil, menhaden oil, palm kernel oil, palm oil, peanut oil, soybean oil, rapeseed oil, linseed oil, rice bran oil, pine oil, sesame oil, sunflower seed oil, partially and fully hydrogenated oils from the foregoing sources, and mixtures thereof.
- 35 vii) animal fats and oils, e.g. cod liver oil, lanolin and derivatives thereof such as acetylated lanolin and isopropyl lanolate. Lanolin oil is preferred.
- viii) Also useful are C<sub>4</sub>-C<sub>20</sub> alkyl ethers of polypropylene glycols, C<sub>1</sub>-C<sub>20</sub> carboxylic acid esters of polypropylene glycols, and di- C<sub>8</sub>-C<sub>30</sub> alkyl ethers, examples of which include PPG-14 butyl ether, PPG-15 stearyl ether, dioctyl ether, dodecyl octyl ether, and mixtures thereof.
- 40 ix) polyol carboxylic acid esters.
- 45 Preferably, the present compositions comprise one or more emollients selected from dodecan , squalane, cholesterol, isohexadecane, isononyl isononanoate, lanolin and derivatives thereof, safflower oil, castor oil, coconut oil, cottonseed

oil, palm kernel oil, palm oil, peanut oil, soybean oil, polyol carboxylic acid esters and mixtures thereof.

More preferred emollient materials for use herein are polyol carboxylic acid esters.

The polyol ester preferred for use herein is a nonocclusive liquid or liquifiable polyol carboxylic acid ester. These polyol esters are derived from a polyol radical or moiety and one or more carboxylic acid radicals or moieties. In other words, these esters contain a moiety derived from a polyol and one or more moieties derived from a carboxylic acid. These carboxylic acid esters can also be derived from a carboxylic acid. These carboxylic acid esters can also be described as liquid polyol fatty acid esters, because the terms carboxylic acid and fatty acid are often used interchangeably by those skilled in the art.

The preferred polyol polyesters employed in this invention comprise certain polyols, especially sugars or sugar alcohols, esterified with at least four fatty acid groups. Accordingly, the polyol starting material must have at least four esterifiable hydroxyl groups. Examples of preferred polyols are sugars, including monosaccharides and disaccharides, and sugar alcohols. Examples of monosaccharides containing four hydroxyl groups are xylose and arabinose and the sugar alcohol derived from xylose, which has five hydroxyl groups, i.e., xylitol. The monosaccharide, erythrose, is not suitable in the practice of this invention since it only contains three hydroxyl groups, but the sugar alcohol derived from erythrose, i.e., erythritol, contains four hydroxyl groups and accordingly can be used. Suitable five hydroxyl group-containing monosaccharides are galactose, fructose, and sorbose. Sugar alcohols containing six -OH groups derived from the hydrolysis products of sucrose, as well as glucose and sorbose, e.g., sorbitol, are also suitable. Examples of disaccharide polyols which can be used include maltose, lactose, and sucrose, all of which contain eight hydroxyl groups.

Preferred polyols for preparing the polyesters for use in the present invention are selected from the group consisting of erythritol, xylitol, sorbitol, glucose, and sucrose. Sucrose is especially preferred.

The polyol starting material having at least four hydroxyl groups is esterified on at least four of the -OH groups with a fatty acid containing from about 8 to about 22 carbon atoms. Examples of such fatty acids include caprylic, capric, lauric, myristic, myristoleic, palmitic, palmitoleic, stearic, oleic, ricinoleic, linoleic, linolenic, eleostearic, arachidic, arachidonic, behenic, and erucic acid. The fatty acids can be derived from naturally occurring or synthetic fatty acids; they can be saturated or unsaturated, including positional and geometrical isomers. However, in order to provide liquid polyesters preferred for use herein, at least about 50% by weight of the fatty acid incorporated into the polyester molecule should be unsaturated. Oleic and linoleic acids, and mixtures thereof, are especially preferred.

The polyol fatty acid polyesters useful in this invention should contain at least four fatty acid ester groups. It is not necessary that all of the hydroxyl groups of the polyol be esterified with fatty acid, but it is preferable that the polyester contain no more than two unesterified hydroxyl groups. Most preferably, substantially all of the hydroxyl groups of the polyol are esterified with fatty acid, i.e., the polyol moiety is substantially completely esterified. The fatty acids esterified to the polyol molecule can be the same or mixed, but as noted above, a substantial amount of the unsaturated acid ester groups must be present to provide liquidity.

To illustrate the above points, a sucrose fatty triester would not be suitable for use herein because it does not contain the required four fatty acid ester groups. A sucrose tetra-fatty acid ester would be suitable, but is not preferred because it has more than two unesterified hydroxyl groups. A sucrose hexa-fatty acid ester would be preferred because it has no more than two unesterified hydroxyl groups. Highly preferred compounds in which all the hydroxyl groups are esterified with fatty acids include the liquid sucrose octa-substituted fatty acid esters.

The following are non-limiting examples of specific polyol fatty acid polyesters containing at least four fatty acid ester groups suitable for use in the present invention: glucose tetraoleate, the glucose tetraesters of soybean oil fatty acids (unsaturated), the mannose tetraesters of mixed soybean oil fatty acids, the galactose tetraesters of oleic acid, the arabinose tetraesters of linoleic acid, xylose tetralinoleate, galactose pentaoleate, sorbitol tetraoleate, the sorbitol hexaesters of unsaturated soybean oil fatty acids, xylitol pentaoleate, sucrose tetraoleate, sucrose pentaoleate, sucrose hexaoleate, sucrose hepatoleate, sucrose octaoleate, and mixtures thereof. As noted above, highly preferred polyol fatty acid esters are those wherein the fatty acids contain from about 14 to about 18 carbon atoms.

The preferred polyol polyesters preferred for use herein have complete melting points below about 30°C, preferably below about 27.5°C, more preferably below about 25°C. Complete melting points reported herein are measured by Differential Scanning Calorimetry (DSC).

The polyol fatty acid polyesters suitable for use herein can be prepared by a variety of methods well known to those skilled in the art. These methods include: transesterification of the polyol with methyl, ethyl or glycerol fatty acid esters using a variety of catalysts; acylation of the polyol with a fatty acid chloride; acylation of the polyol with a fatty acid anhydride; and acylation of the polyol with a fatty acid, per se. See, for example, U.S. Patent No. 2,831,854; U.S. Patent No. 4,005,196, to Jandacek, issued January 25, 1977.

An especially preferred material is known by the INCI name sucrose polycottonseedate.

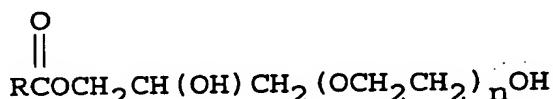
The term "complete melting point", as used herein means a melting point as measured by the well-known technique of Differential Scanning Calorimetry (DSC). The complete melting point is the temperature at the intersection of the baseline, i.e. the specific heat line, with the line tangent to the trailing edge of the endothermic peak. A scanning temperature of 5°C/minute is generally suitable in the present invention for measuring the complete melting points. However, it should be recognised that more frequent scanning rates may be deemed appropriate by the analytical chemist skilled in the art in specific circumstances. A DSC technique for measuring complete melting points is also described in US Patent No. 5,306,514, to Letton et al., issued April 26, 1994.

The term "nonocclusive" as used herein, means that the component as so described does not substantially or block the passage of air and moisture through the skin surface.

**Polyethylene glycol derivatives of glycerides**

The compositions herein may optionally comprise polyethylene glycol derivatives of glycerides. Suitable polyethylene glycol derivatives of glycerides include any polyethylene glycol derivative of glycerides which are water-soluble and which are suitable for use in a skin care composition. Suitable polyethylene glycol derivatives of glycerides for use herein include derivatives of mono-, di- and tri-glycerides and mixtures thereof.

One class of polyethylene glycol derivatives of glycerides suitable herein are polyethyleneglycol glyceryl fatty esters having the formula (1):



wherein n, the degree of ethoxylation, is from about 4 to about 200, preferably from about 5 to about 100, more preferably from about 6 to about 80, and wherein R comprises an aliphatic radical having from about 5 to about 25 carbon atoms, preferably from about 7 to about 20 carbon atoms.

Suitable polyethylene glycol derivatives of glycerides include PEG-20 almond glycerides, PEG-60 almond glycerides, PEG-11 avocado glycerides, PEG-6 capric/caprylic glycerides, PEG-8 capric/caprylic glycerides, PEG-20 corn glycerides, PEG-60 corn glycerides, PEG-60 evening primose glycerides, PEG-7 glyceryl cocoate, PEG-30 glyceryl cocoate, PEG-40 glyceryl cocoate, PEG-78 glyceryl cocoate, PEG-80 glyceryl cocoate, PEG-12 glyceryl dioleate, PEG-15 glyceryl isostearate, PEG-20 glyceryl isostearate, PEG-30 glyceryl isostearate, PEG-75 cocoa butter glycerides, PEG-20 hydrogenated palm oil glycerides, PEG-70 mango glycerides, PEG-13 mink glycerides, PEG-75 shorea butter glycerides, PEG-10 olive glycerides, PEG-12 palm kernal glycerides, PEG-45 palm kernal glycerides, PEG-8 glyceryl laurate and PEG-30 glyceryl laurate.

Mixtures of polyethylene glycol derivatives of glycerides can also be used herein.

5 Preferred for use herein is a polyethylene glycol derivative of sunflower oil commercially available from Floratech under the tradename Florasun PEG-10.

#### **Water**

The compositions of the present invention will also preferably comprise water. When present water will preferably comprise from about 10% to about 90%, 10 more preferably from about 20% to about 80%, even more preferably from about 30% to about 60%, by weight, of the total composition

#### ***Other Optional Ingredients***

The compositions of the present invention can comprise a wide range of other optional components. These additional components should be pharmaceutically acceptable. Non-limiting examples of functional classes of ingredients suitable for use in the compositions of the present invention include: abrasives, absorbents, antibiotics, anticaking agents, anti-dandruff agents, anti-perspirant agents, antioxidants, vitamins, biological additives, bleach, bleach activators, 15 brighteners, builders, buffering agents, chelating agents, chemical additives, colorants, cosmetics, cleansers, cosmetic astringents, cosmetic biocides, denaturants, deodorants, desquamation actives, depilatories, drug astringents, 20 dyes, dye transfer agents, enzymes, external analgesics, flavours, film formers, fragrance components, insect repellents, mildewcides, opacifying agents, 25 oxidative dyes, oxidising agents, pest control ingredients, pH adjusters, pH buffers, pharmaceutical actives, plasticizers, preservatives, radical scavengers, skin, hair or nail bleaching agents, skin, hair or nail conditioners, skin, hair or nail penetration enhancers, stabilisers, surfactants, surface conditioners, reducing agents, temperature depressors, and warmth generators. Also useful 30 herein are aesthetic components such as colorings, essential oils, and skin healing agents. Other optional materials herein include pigments. Pigments suitable for use in the compositions of the present invention can be organic and/or inorganic. Also included within the term pigment are materials having a low colour or lustre such as matte finishing agents, and also light scattering 35 agents. Examples of suitable pigments are iron oxides, acyglutamate iron oxides, titanium dioxide, ultramarine blue, D&C dyes, carmine, and mixtures thereof.

#### ***Method of Use***

40 The cosmetic compositions of the present invention may be used in a conventional manner for care of human skin. An effective amount of the composition, typically from about 1 gram to about 50 grams, preferably from about 1 gram to about 20 grams, is applied to wet or dry, preferably wet, skin. Application of the composition typically includes working the composition into 45 the skin, generally with the hands and fingers. The composition is then left on the skin or, preferably, the skin is rinsed.

The preferred method of treating the skin therefor comprises the steps of:

- (a) applying an effective amount of the cosmetic composition to the skin,
- (b) rinsing the skin.

**5 Examples**

The following examples further illustrate the preferred embodiments within the scope of the present invention. The examples are given solely for the purposes of illustration and are not to be construed as limitations of the present invention as many variations of the invention are possible without departing from its spirit or scope. Unless otherwise indicated, all ingredients are expressed on a weight percentage of the active ingredient.

	<b>Example I (wt %)</b>	<b>Example II (wt %)</b>
Glycerine	25	30
Sucrose	25	20
Polycottonseedate		
Jaguar HP105 <sup>1</sup>	0.5	0.6
Methyl paraben	0.2	0.2
Propyl paraben	0.1	0.1
Perfume	0.5	0.5
SC3 <sup>2</sup>	3	4
Florasun PEG-10 <sup>3</sup>	2	2
Water	to 100	to 100

<sup>1</sup> available from Rhodia, Paris, FR

<sup>2</sup> SC3 prepared according to Synthesis Example SC3 hereinabove

<sup>3</sup> available from Floratech, AZ, USA

The methyl paraben, propyl paraben, Jaguar HP 105, Florasun PEG-10, SC3 and perfume are all mixed together. Then the glycerine is added with 5-10 minutes of high sheer mixing. Then the water is added with a further 5-10

20 minutes of high sheer mixing. Then the sucrose polycottonseedate is added with 5-10 minutes of high sheer mixing.

	<b>Example III (wt %)</b>
Urea	30
Sucrose	20
Polycottonseedate	
Jaguar HP105 <sup>1</sup>	0.5
Methyl paraben	0.2
Propyl paraben	0.1
Perfume	0.5
SC3 <sup>2</sup>	4
Florasun PEG-10 <sup>3</sup>	2
Water	to 100

<sup>1</sup> available from Rhodia, Paris, FR

<sup>2</sup> SC3 prepared according to Synthesis Example SC3 hereinabove  
<sup>3</sup> available from Floratech, AZ, USA

5 The methyl paraben, propyl paraben, Jaguar HP 105, urea, Florasun PEG-10, SC3 and perfume are all mixed together. Then the water is added with a 5-10 minutes of high sheer mixing. Then the sucrose polycottonseedate is added with a further 5-10 minutes of high sheer mixing.

	Example IV (wt %)
Glycerine	35
Sucrose	15
Polycottonseedate	
Jaguar HP105 <sup>1</sup>	0.5
Methyl paraben	0.2
Propyl paraben	0.1
Perfume	0.5
SC3 <sup>2</sup>	4.5
Water	to 100

10      <sup>1</sup> available from Rhodia, Paris, FR  
<sup>2</sup> SC3 prepared according to Synthesis Example SC3 hereinabove

15 The methyl paraben, propyl paraben, Jaguar HP 105, SC3 and perfume are all mixed together. Then the glycerine is added with 5-10 minutes of high sheer mixing. Then the water is added with a further 5-10 minutes of high sheer mixing. Then the sucrose polycottonseedate is added with 5-10 minutes of high sheer mixing.

The compositions of the above examples provide good moisturisation benefits with low levels of stickiness or tack.

## Claims:

1. A skin care composition comprising:

5 (a) a quaternary ammonium cationic conditioning agent having formula (I):



(I)

wherein each R in a compound is a C<sub>6</sub>-C<sub>22</sub>, preferably with only minimal, or no, C<sub>6</sub>-C<sub>10</sub>, hydrocarbyl group, preferably having an Iodine Value (hereinafter also referred to as IV) of from about 70 to about 140 based upon the IV of the equivalent fatty acid, n is a number from 1 to three on the weight average in any mixture of compounds, each R<sup>1</sup> in a compound is a C<sub>1-3</sub> alkyl or hydroxy alkyl group, the total of n and the number of R<sup>1</sup> groups that are hydroxyethyl groups equaling 3, n+m equaling 4, and X is a conditioner compatible anion, preferably methyl sulfate, the conditioning agent preferably having (a) a Hunter L transmission of at least about 85, (b) non-detectable levels at the conditions of use of odorous compounds selected from isopropyl acetate, 2,2'-ethylidenebis(oxy)bispropane, and/or short fatty acid esters or (c) preferably both, wherein preferably the level of conditioning agent containing polyunsaturated alkylene groups being at least about 3% by weight of the total conditioning agent present and wherein the aqueous dispersion comprises a mixture of monoester and diester; and

25 (b) greater than 10%, by weight, humectant.

2. A composition according to Claim 1 wherein each R substituent has a cis:trans ratio (for the C18:1 component) of from about 1:1 to about 20:1 based upon the equivalent fatty acid.

30 3. A composition according to Claim 1 or 2 wherein the Hunter L transmission is from about 85 to about 95, preferably from about 90 to 95.

35 4. A composition according to any of the preceding claims wherein said composition comprises from about 0.1% to about 20%, preferably from about 1% to about 10%, more preferably from about 2% to about 4.5%, by weight, of quaternary ammonium conditioning agent.

40 5. A composition according to any of the preceding claims wherein said humectant is selected from glycerine, butylene glycol, urea, hexylene glycol, panthenol and polyethylene glycol and derivatives thereof, or mixtures thereof.

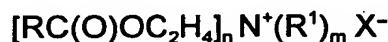
6. A composition according to any of the preceding claims wherein said humectant is glycerine.
7. A composition according to any of the preceding claims wherein said composition comprises from about 12% to about 60%, more preferably from about 15% to about 50%, by weight, of humectant.  
5
8. A composition according to any of the preceding claims wherein said composition additionally comprises an oil-soluble skin care component.  
10
9. A composition according to any of the preceding claims wherein said composition additionally comprises an oil-soluble skin care component selected from dodecane, squalane, cholesterol, isohexadecane, isononyl isononanoate, lanolin and derivatives thereof, safflower oil, castor oil, coconut oil, cottonseed oil, palm kernel oil, palm oil, peanut oil, soybean oil, polyol carboxylic acid esters and mixtures thereof.  
15
10. A cosmetic method of treatment comprising applying to the skin, hair or nails a composition according to any of the preceding claims.

**Abstract**

According to the present invention there is provided a cosmetic composition comprising:

5

(a) a quaternary ammonium cationic conditioning agent having formula (I):



10 wherein each R in a compound is a C<sub>6</sub>-C<sub>22</sub>, preferably with only minimal, or no, C<sub>6</sub>-C<sub>10</sub>, hydrocarbyl group, preferably having an Iodine Value (hereinafter also referred to as IV) of from about 70 to about 140 based upon the IV of the equivalent fatty acid, n is a number from 1 to three on the weight average in any mixture of compounds, each R<sup>1</sup> in a compound  
 15 is a C<sub>1</sub>-C<sub>3</sub> alkyl or hydroxy alkyl group, the total of n and the number of R<sup>1</sup> groups that are hydroxyethyl groups equaling 3, n+m equaling 4, and X is a conditioner compatible anion, preferably methyl sulfate, the conditioning agent preferably having (a) a Hunter L transmission of at least about 85, (b) non-detectable levels at the conditions of use of odorous compounds  
 20 selected from isopropyl acetate, 2,2'-ethylidenebis(oxy)bispropane, and/or short fatty acid esters or (c) preferably both, wherein preferably the level of conditioning agent containing polyunsaturated alkylene groups being at least about 3% by weight of the total conditioning agent present and wherein the conditioning agent comprises a mixture of monoester and  
 25 diester; and

(b) greater than 10%, by weight, of humectant.

30 The compositions of the invention provide good moisturisation benefits with low levels of stickiness or tack. According to a further aspect of the present invention there is provided a cosmetic method of treatment of the skin comprising applying to the skin a composition according to the present invention.

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